Work Orde		2		*893	382*							Page 1
Revision ID:	D212-664-207 Crosstube Low St	andard Aft		Accept	*N900	<u>040</u>	100	<b>)*</b> s	Setup	Start Stop	*N *N	S1* S2*
Start Date: Required Date: Reference:		tart Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	ID:						
Approvals:		MLJ	Date: 12/08/29) Date:	Tooling: SPC (Y/N):		ate:		F		Start Stop	*N	R1* R2*
Sequence ID/ Work Center ID	0	peration escription		Set Up/ Run Hours	Tool ID		Plan Code	Accept Qty	Reje Qty		Reject Number	Insp. Stamp
Draw Nbr	Revisio	on Nbr										
D212-664-247	Rev B	(DEO)										
*100*	D	OCUMENT CONTRO	OL.	0.00		,		_\_				DAS 05/12:10
DC Document Control		<b>Memo</b> Photocopy	bluefile and create labels as	0.00 per PPP D212-664-207	CHG002	,		1	40	(m	(1151	DAS 05/12-10 2-10-3
110		ck Kit		0.00				( A				
*110* Packaging Packaging	P	nckaging Memo		0.00				MO			2-9-	[8]
120	:	ENDING MACHINE	- CROSSTUBES	0.00	•	M	)/	Lus		, -	a (a	101
*120* CNC Bend 2	•	Memo	**	0.00				-M		12	4-	/ <del>X</del>
CNC Alpha 160 Ben	der		as per Dwg D212-664-247 u	ising CNC bender progra	am and Folio							

NCR:													
											QA Closed:		:
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part   NCR	No.					Rework Scrap Use-as-is Work Order Update			Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	-	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial	Δ	ction	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Cr	nief Eng	Des	scription	Date	Verification	QC Inspector
Doc/Data							1			•			
Equip/Tooling		]											
Operator		]							:		1		
Material	L							; •					
Setup									( ) :				
Other													
Process								٠					
Supplier	0												
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Landi		3			_	<b>General</b> Bend		10			٠		
	_	Bending Centre No	t Canson	+=ia+a(	\_	BOM/Route	-	Grain Hardwa		ļ	Ovalized Over/Under	<b>.</b>	Pressure/Forced Temperature/Cure
		Cracks	t concer	itric to t	)/3	Broken/Damaged	$\vdash$	-	re on Incomplete	-	Part Incorred	<u> </u>	Weld
	-	Crushed/0	rimped		<del> </del>	Burrs	$\vdash$	1 '	ions Incomplete	/Uncloar	Part Lost/Mi	<b> </b>	Wrong Stock Pulled
	$\vdash$	Cuffs	ompeu.		-	Contamination	$\vdash$	Mainte	•	- Officieal	Part Moved	33111g	
		Heat Trea	t		<u> </u>	Countersink	$\vdash$	Mislabe			Positioned V	drong.	
		Inspection		Tube	<b>-</b>	Cut Too Short		Misread			Power Loss/	_	Other
		Ripples in	-		<del> -</del>	Drill Holes	$\vdash$	Offset	•	<u> </u>	]. 55. 2555,		1
		Torque W		xtrusior	, <u> </u>	Drawing		4	Calibration				
Turning Sequence Finish								4	equence				

Outside Dimensions

DQA:

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-24-12 1:44:47 PM

Item ID:

D212-664-207

Accept

\*N900040100\*

Setup Start

**Revision ID:** 

**Start Date:** 

Item Name:

Crosstube Low Standard Aft

Start Oty: 1.00

**Cust Item ID:** 

Required Date: 9/14/12

8/21/12

Req'd Qty: 1.00

**Customer:** 

Reference:

**Approvals:** 

Process Plan:

Date:

Tooling:

Date:

Run

Stop

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/ **Work Center ID** 

130

**Description** 

Operation

QC15- Crosstube Dimensional Check

Set Up/ **Run Hours**  **Tool ID** 

Tool # Plan Code

Accept Qty

Reject Qty

Reject Number Stamp

Insp.

\*120\*

OC

Quality Control

Memo

140

\*140\* Crosstubes

Crosstubes

Crosstubes

Memo

0.00

0.00

1-Drill Rivet holes as per Dwg D212-664-247 using DT8972.\*\*\*Use T-Pin\*\*\*

2-Drill pilot holes in tube as per Dwg D212-664-247 using DT8550 and DT8551

3-Ream hole to finish size in tube as per Dwg D212-664-247

\*\*\*\*\*\* ENSURE PROPER JIG POSITIONING \*\*\*\*\*\*\*\*

4-\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-247

5-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-247

12-9-21

NCR:	Yes	/ No				WORK ORDER NON-C	CONFOR	RMANCE / UP	DATE	04 Classide	Datas	**
				<del> </del>		DISPOSITION		· · · · · · · · · · · · · · · · · · ·	ACAINIST DE	QA Closed:	Date:	
Work Ord	er:					DISPOSITION	.		AGAINST DE	:PAKTIVIENT) -	PROCESS	
						Rework		Skid-tube	Crosstube		Water Jet	Engineering
Part	No.					Scrap		Machining	Small Fab	-	d. Eng. Coor.	Quality
NGD						Úse-as-is	The	rmoforming	Finishing	Rec/Stor	e/Packaging	Other
NCR	NO.				<del></del>	Work Order Update		Large Fab	Composite	]	Supplier	J
Root					Descri	ption of work order update	Initial		tion	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Chief En	g Desci	ription	Date	Verification	QC Inspector
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quip/Tooling	<u> </u>							. ]				
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Material							,					
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napproved	<u> </u>		<u> </u>			-		50007		ļ		
Landi				<del></del>	<del> </del>	General F/	AULT CAT	EGURY				
Lanoi		Bending				Bend	Grain		<u> </u>	Ovalized		Pressure/Forced
	⊢	Centre No	t Concor	stric to O	/s	BOM/Route	Hardy		-	Over/Under	tolorance	Temperature/Cure
	$\vdash$	Cracks	n concer	itric to O	″³ <del> </del>	Broken/Damaged	_	tion Incomplete	-	Part Incorred	<del></del>	Weld
	$\vdash$	Crushed/0	rimned			Burrs		ctions incomplete/l	Unclear	Part Lost/Mi		Wrong Stock Pulled
	$\vdash$	Cuffs	ermpea,			Contamination	<del></del>	tenance	one can	Part Moved	331116	TANLOUIS STOCK Lattica
	<u> </u>	Heat Trea	t			Countersink	Mislal			Positioned W	/rong	
	$\vdash$	Inspection		Tube		Cut Too Short	Misre		-	Power Loss/		Other
		Ripples in			<u> </u>	Drill Holes	Offset		<u> </u>	1. 5.70. 25557.	,	
		Torque W		xtrusion	-	Drawing		Calibration				
		Turning Se				Finish	⊢⊢	Sequence		<del></del>		
	Г	Wave/Twi		e		Folio	<b>⊢</b> ⊸	le Dimensions				

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Order ID 89382

Page 3

August-24-12 1:44:47 PM

Required Date: 9/14/12

Item ID:

D212-664-207

Accept

\*N900040100\*

Date:

Setup Start

**Revision ID:** 

Item Name:

Crosstube Low Standard Aft

**Start Date:** 

8/21/12

Start Qty: 1.00 Req'd Qty: 1.00

Date:

**Cust Item ID:** 

**Customer:** 

Reference:

Approvals:

Process Plan:

Date:

Tooling: SPC (Y/N): Date:

Run

Sequence ID/ **Work Center ID** 

Operation **Description** 

Set Up/ **Run Hours**  **Tool ID** 

Tool # Plan

Code

Accept Qty

Reject Qty

Reject Number

Insp. Stamp

150

QC5- Inspect part completeness to step on W/O

\*150\* Quality Control

Memo

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

160

\*160\*

HandFXtube

0.00

0.00

Hand Finishing Crosstubes

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1- CLEAN CROSSTUBE WITH WASH'N WIPE

180

Outsource process - NDT per QSI038 4.1

0.00

\*120\*

Outsource2

Memo

Memo

0.00

Outsource process - NDT

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 1805 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

11 12-9-27

CX 12/08/27 (

												DQA:	Da	ate:	• 3
NCR:	Yes	/ No				WORK ORDER NON-C	O	NFOR	MANCE / UP	DATE		_		•	~ t*
						= 1, 200 = 1200 to to to to			- · · · · · · · · · · · · · · · · · · ·		QA	Closed:	Da	ate:	
Work Ord	er.					DISPOSITION				AGAINST DI	EPAR	TMENT/	PROCESS		
Work Ord						Rework	1		Skid-tube	Crosstube	7		Water Jet	٠	Engineering
Part I	No.					Scrap	1		Machining	Small Fab	1	Proc	d. Eng. Coor	_	Quality
			<del></del>			Use-as-is	1		noforming	Finishing	F		e/Packaging		Other
NCR f	۷o					Work Order Update	]		Large Fab	Composite	1		Supplier		
											<del></del>	·			· · · · · · · · · · · · · · · · · · ·
Root	1	_	_		•	otion of work order update	1	Initial		tion	1	ign &			
Cause	_	Date	Step	Qty	C	or Non-conformance	Ch	ief Eng	Desci	ription		Date	Verification	<u>n</u>	QC Inspector
Doc/Data	Н									•					
Equip/Tooling	Щ						l								
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Setup	$\Box$						ł	· *				]			
Other	_							, , , , , , , , , , , , , , , , , , ,							
Process	_							*							
Supplier	_						l								
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Landi						General		ا ما		<del></del>	٦_				1
	$\vdash$	Bending			.,	Bend		Grain		-	┥	lized		<u> </u>	Pressure/Forced
	Centre Not Concentric to O/S  BOM/Route  Broken/Damaged						$\vdash$	Hardwa		ļ	4		tolerance	$\vdash$	Temperature/Cure
	-	Cracks			<u> </u>	Broken/Damaged	-	1	on Incomplete		<b>⊣</b>	Incorrec		$\vdash$	Weld
	—	Crushed/0	Crimped.			Burrs		1	ions Incomplete/l	Jnclear	-	Lost/Mis	ssing		Wrong Stock Pulled
	Cuffs Contamination Heat Treat Countersink						-	Mainte		<u> </u>	┥	Moved			
				Countersink	$\vdash$	Mislabe		<u> </u>	-	itioned W	-	_	1		
	Inspection Strip in Tube Cut Too Short							Misread			Pow	er Loss/S	Surge	L	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-24-12 1.	:44:47 PM				1017						
Item ID: Revision ID:	D212-664-2	207		Accept	*N900	<b>040</b>	100	)* ፡	Setup Star	1.71	S1*
Item Name:	Crosstube Lo	w Standard Aft							Stop	, <b>*N</b>	S2*
Start Date:	8/21/12	Start Qty: 1.00	*1*		Cust Item I	D:					
Required Date:	9/14/12	<b>Req'd Qty:</b> 1.00	*1*		<b>Customer:</b>						
Reference:								_	- 0.		
Approvals:	Process Pl	an:	Date:	Tooling:	Da	ate:		ŀ	Run Star	1/1	R1*
	QC:		Date:	SPC (Y/N):	Da	ate:			Stop	` *N	R2*
Sequence ID/ Work Center II	<b>D</b>	Operation Description		Set Up/ Run Hours	Tool ID	Tool#	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190		Receive & Inspect for Da	amage & Mat'l Certs	0.00							, i
*190*		Packaging		0.00					/01.	2/5/2	2/1/
Packaging		Memo	LATEN OF ONE OWN	0.00	Incess				•	17	
Packaging		*** WEAR	LATEX GLOVES WHI	EN HANDLING CROSST	UBETTT						
		Ensure copy	of NDT results attached	d to work order.							
*200		QC5- Inspect part compl	leteness to step on W/O	0.00	1 1 2012 17			ΛQ_	120	- 27	
QC		Memo		نڌ يع  \ <sub>0.00</sub>	Blade			40		- 4 /	
Quality Control			LATEX GLOVES WHI	EN HANDLING CROSSTU	UBE***						
		Inspect for o	damage & ensure results	are as per Dwg D212-664-	-207						
204		Crosstubes Chemical Co	onversion	0.00							
*204*								A	12 - 9	7-27	

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1- PRESSURE WASH AND THEN USE WASH'N WIPE TO CLEAN CROSSTUBE AND CUFF BEFORE CHEMICAL CONVERSION

											DQA:	Date:	• ,
NCR:	Yes	/ No				WORK ORDER NON-O	COI	NFOR	MANCE / UPD/	ATE			*
											QA Closed:	Date:	
Nork Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	PROCESS	
Part NCR	No.					Rework Scrap Use-as-is Work Order Update		Thern	Skid-tube Machining noforming	Crosstube Small Fab Finishing	4	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCK	NO.					work Order Opdate	ן נ		Large Fab	Composite		Supplier	J LJ
Root					Desc	ription of work order update		Initial	Actio	n	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	nief Eng	Descrip	tion	Date	Verification	QC Inspector
oc/Data quip/Tooling perator laterial etup ther rocess upplier raining								<b>3</b>					
			·	·		F	AUL	T CATE	GORY		\		
Landi	ng (	Gear				General		}*			-		
	Bending Centre Not Concentric to O/S Cracks Broken/Damaged Burrs Cuffs Contamination Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion Bend BoM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing					_	Instruct Mainte Mislabe Misread Offset	on Incomplete ions Incomplete/Und nance led	clear	Ovalized Over/Under Part Incorred Part Lost/Mis Part Moved Positioned W Power Loss/S	ssing /rong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other	
		Turning Se	equence			Finish		Out of S	equence				

Outside Dimensions

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

122443

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

D212-664-247, with Sika flex in Between tube & Cuff

A/R SIKAFLEX -241/-291 BATCH:

1-Rivet and assemble Cuffs with T-Pin in the through bolt holes as per Dwg

Crosstubes

NCR:	Yes	/ No				WORK ORDER NON-	CO	NFORI	MANCE / UPI	DAIE	QA Closed:	Date	<del>?</del> 2:
Work Ord	or.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part   NCR	No.					Rework Scrap Use-as-is Work Order Update			Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	-∤	Water Jet od. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial	Act	ion	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Cł	nief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved													
							AUI	LT CATE	GORY				
Landi		i				General Bend		Grain			]		7- /- /-
	_	Bending Centre No	at Cancar	atric to (	\(\begin{array}{c} \big  -	BOM/Route	$\vdash$	Hardwa			Ovalized Over/Under	+-1	Pressure/Forced
	-	Cracks	or concer	itric to t	<sup>)/3</sup>	Broken/Damaged	-	4		ļ	Part Incorre	<u> </u>	Temperature/Cure Weld
	<del></del>	Crushed/	Crimpod		-	Burrs	$\vdash$	4	on Incomplete ions Incomplete/L	Inclose	Part Lost/M	<del> </del>	Wrong Stock Pulled
	-	Cuffs	crimpeu.		-	Contamination	-	Mainte		Inclear -	Part Moved	· L	
	ш	Heat Trea	+		<b>├</b>	Countersink	$\vdash$	Mislabe			-1		
	-	Inspection		Tubo	<del> </del>	Cut Too Short	-	Misread		-	Positioned \ Power Loss/	_	Other
	-			Tube	-	Drill Holes	-	Offset	I	L	Jeower ross/	onige [	Other
	Ripples in Bend Drill Holes Torque Waves in Extrusion Drawing							4	Calibration				
	ı 8	HOI YUE W	aves III E	Att usiot	'	ן טי awing	1	TOUL OF C	.สแมเสนเบท				

Out of Sequence

Outside Dimensions

DQA:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Spray Painting

\*\*\* WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\*

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 6:00 Fininsh Time: 7500

PAINT:

											DQA	.: Date	: <u> </u>
NCR:	Yes	/ No				WORK ORDER NON-O	100	NFORM	MANCE / UP	PDATE		<u> </u>	
											QA Closed	i: Date	:
Work Ord	er.					DISPOSITION				AGAINST DE	PARTMEN	T/PROCESS	
Work Ord	C1.			<del></del>		Rework	1		Skid-tube	Crosstube	1	Water Jet	Engineering
Part	No.					Scrap	1	1	Machining	Small Fab	Pr	od. Eng. Coor.	Quality
						Use-as-is	1	ı	noforming	Finishing	4	ore/Packaging	Other
NCR	No.					Work Order Update			Large Fab	Composite		Supplier	
								<u> </u>			- -		
Root					1	ption of work order update	1	Initial		ction	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data							ľ						
Equip/Tooling													
Operator													
Material													
Setup													
Other													
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Supplier													
Training							ŀ						
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						F <i>i</i>	AUL	T CATE	GORY				
Landi	ng (	Gear		*		General					,		
		Bending				Bend		Grain			Ovalized	_	Pressure/Forced
	Centre Not Concentric to O/S BOM/Route							Hardwa	re		Over/Unde	r tolerance	Temperature/Cure
	Cracks Broken/Damaged							Inspecti	on Incomplete		Part Incorr	ect	Weld
	Crushed/Crimped. Burrs							Instructi	ions Incomplete	'Unclear	Part Lost/N	/lissing	Wrong Stock Pulled
	Cuffs					Contamination		Mainte	nance		Part Moved		
	Heat Treat C					Countersink		Mislabe	led		Positioned	Wrong	
		Inspection	Strip in	Tube		Cut Too Short		Misread	l		Power Loss	S/Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Ord August-24-12		0382		*893	382*						Page 7
Item ID: Revision ID:	D212-664-2			Accept	*N900	<b>040</b>	100	<b>)*</b> s	Setup Star	1.7	S1*
Item Name: Start Date: Required Date Reference:	8/21/12	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*		Cust Item I Customer:	D:				, "IVI	S2*
Approvals:		an:			Di	R	tun Star Sto	!/	R1*		
Sequence ID/ Work Center I		Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230 *230* QC		QC14- Inspect Spray Pai	nt	0.00					B	12:10	0/
Quality Control		Memo Wrap in plas	stic bag to protect from so								
240				0.00							<i>(</i> 54°
*740* Crosstubes		Crosstubes Memo	as ner Dwg D212,664.2	0.00						\$	05

Crosstubes

1- Assemble as per Dwg D212-664-247

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015 A/R Proseal 890 Batch: \\ \(\mathbb{L}\)3\\ \(\omega\)3

3- Torque bolts as per dwg

											DQA:	Date:	,
NCR:	Yes	/ No				WORK ORDER NON-C	COI	NFORM	MANCE / UP	DATE		,	•
											QA Closed:	Date:	
Work Ord	ler:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Work Ord	ıcı.					Rework	1		Skid-tube	Crosstube	1	Water Jet	Engineering
Part	No.					Scrap		1	Machining	Small Fab	Pro	d. Eng. Coor.	Quality
			Use-as-is Thermoforming Finishing						-}	re/Packaging	Other		
NCR	No.					Work Order Update						Supplier	
				<del></del>	· - ·			<u> </u>	<del>,</del>	<del></del>		1	
Root			1		· ·	ption of work order update	1	Initial		ction	Sign &	]	
Cause	<b>.</b>	Date	Step	Qty		or Non-conformance	Cr	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data	_												
Equip/Tooling	<u> </u>												
Operator	_												
Material													
Setup													
Other													
Process				:									
Supplier													
Training													
Unapproved													
	•					F.	AUL	T CATE	GORY				
Landi	ing (	Gear				General		_			_		-
	Ŀ	Bending				Bend		Grain			Ovalized		Pressure/Forced
	Centre Not Concentric to O/S BOM/Route Hardware							Over/Under	tolerance	Temperature/Cure			
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	L	Crushed/	Crimped.			Burrs		Instructi	ions Incomplete/	'Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs					Contamination		Mainte	nance		Part Moved		_
		Heat Trea	t			Countersink		Mislabe	led		Positioned \	Vrong	
	Inspection Strip in Tube Cut Too Short Misread									Power Loss	Surge	Other	

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Work Orde		2382		*	89	382*						Page 8
Item ID: Revision ID: Item Name:	D212-664-2 Crosstube Lo	07 w Standard Aft		Accept		*N900	040	100	<b>)*</b> s	Setup Star Stop	IV	S1* S2*
•	8/21/12 9/14/12	Start Qty: 1.00 Req'd Qty: 1.00	*1* *1*			Cust Item 1 Customer:	ID:					
Approvals:		an:			_		ate:		R	tun Star Stop	, "I <b>V</b> I	R1* R2*
Sequence ID/ Work Center II 250 *250*	D	Operation Description QC5- Inspect part compl	eteness to step on W/O		Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
QC Quality Control		Memo		0.00	9ز.							
*255 *255* Packaging Packaging		Pick Kit  Memo		0.00						Apf (	102 (C	/>
<sup>260</sup> <b>*2հՈ*</b> ՉC		QC4- 100% Inspect kits	for completeness	0.00								DAS 05 12 10

Quality Control

NCR:	(Yes) /	No
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# WORK ORDER NON-CONFORMANCE / UPDATE

1- L	
DQA: LDate:	r
11/6/15	1-

										QA Closed:	Date	: 12/10/15
Work Orde	er:	8938	32		DISPOSITION		,		AGAINST DE	PARTMENT	/PROCESS	
Part N NCR N		12-66		207	Rework / Scrap Use-as-is Work Order Update			Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update	11	nitial	Act	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descr	ription	Pate	Verification	QC Inspector
Doc/Data Equip/Tooling Operator	12/10/0	1 25	(	Parts.	He Missing	7	16 16	ADD +0 187 D ANG-40 B 1201	0 <i>4</i> <b>87-</b>	13/10/4	relutory	(DAG)
Material Setup Other Process Supplier Training						1	2042 Hoofort	apporte we app copy of Bon to i	let Bon I uppates	1 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	2/0/2	as 2002
Unapproved			<u> </u>			<u>.l</u>				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		<u> </u>
						AUL.	T CATE	GORY			<u> </u>	
Landin	ng Gear			_	General					7	_	<del>-</del> 1
	Bendin	U			Bend		Grain		ļ	Ovalized	<u> </u>	Pressure/Forced
		Not Conce	ntric to	o/s	BOM/Route	$\vdash$	Hardwa		<u> </u>	Over/Under	<del> </del>	Temperature/Cure
}	Cracks	4 (6		-	Broken/Damaged	_		on Incomplete	–	Part Incorred	· ·	Weld
	Cuffs	d/Crimped		-	Burrs	-		ions Incomplete/L	Inclear	Part Lost/Mi	ssing	Wrong Stock Pulled
·	Heat T			-	Contamination Countersink	$\vdash$	Mainte Mislabe		<u> </u>	Part Moved		
#		eat ion Strip in	Tubo	-	Cut Too Short	-	Misread		-	Positioned V Power Loss/		Other
	<b>⊣</b> `	in Bend	Tube	-	Drill Holes	-	Offset	ı	<u> </u>	Jrowel Loss/.	Juige	Totalei
-		Waves in E	xtrusio	, <u> </u>	Drawing	$\vdash$		Calibration				
ļ <b>†</b>	<b>⊣</b> `	Sequence			Finish	-		equence			<del>- 1</del>	
		rwist in Tul			Folio	-		Dimensions				

August-24-12 1:44:47 PM Accept \*N900040100\* Setup Start Item ID: D212-664-207 **Revision ID:** Crosstube Low Standard Aft Item Name: 8/21/12 Start Qty: 1.00 **Cust Item ID: Start Date:** Req'd Qty: 1.00 Required Date: 9/14/12 **Customer:** Reference: Run Tooling: Date: Approvals: Process Plan: Date: Stop SPC (Y/N): Date: Date:

Sequence ID/ Work Center ID Operation Description Set Up/ **Run Hours** 

Tool ID

Tool # Plan Code

Reject Accept **Qty** 

Qty

Reject Number Stamp

Insp.

270 \*270\*

Packaging

Memo

0.00

0.00

Packaging Packaging

Identify and pack for shipping as per PPP D212-664-207

280

QC21- Final Inspection - Work Order Release

0.00

Quality Control

Memo

0.00

U 1242-11

NCK:	res /	INO				WORK ORDER NON-C	JON	NFORI	VIAINCE / UP	DATE	QA Closed:	Date:	4
						DISPOSITION			•	AGAINST DE		/PROCESS	
Work Orde	-				<del>.</del>	Rework Scrap	]		Skid-tube .	Crosstube Small Fab	]	Water Jet d. Eng. Coor.	Engineering Quality
NCR N						Use-as-is Use-as-is Work Order Update		Thern	noforming Large Fab	Finishing Composite	4	re/Packaging Supplier	Other
Root					Descri	ption of work order update	li	nitial	Act	ion	Sign &		
Cause	D	ate	Step	Qty	(	or Non-conformance	Ch	ief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling									•		·		
Operator Material			•			£	: :						
Setup Other													·
Process		1											
Supplier		-							•			,	
Training		ľ											
Unapproved													
						F.	AUL'	T CATE	GORY				
Landir	ng Gear			•		General	_						
	_	ding				Bend	Ш	Grain	*		Ovalized		Pressure/Forced
	_		t Concer	itric to (	o/s	BOM/Route	Ш	Hardwa	re		Over/Under	<del></del>	Temperature/Cure
	Cra					Broken/Damaged	-		on Incomplete	<del></del>	Part Incorred	<del> </del> i	Weld
	_		rimped.		<u> </u>	Burrs			ions Incomplete/L	<del></del>	Part Lost/Mi	ssing	Wrong Stock Pulled
,	Cuff				<u> </u>	Contamination	-	Mainte			Part Moved	•	
1		t Treat			<u> </u>	Countersink		Mislabe		<del></del>	Positioned V		
			Strip in	Tube		Cut Too Short	-	Misread			Power Loss/	Surge	Other
	— 1 ``	oles in I				Drill Holes	-	Offset					
}	_	•	ives in E	xtrusio	<del></del>	Drawing	Н		alibration				
	Turi	ning Se	quence		1	Finish		Out of S	equence				

Outside Dimensions

DQA:

Date:

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

## **Picklist Print**

August-24-12 1:44:46 PM

Work Order ID:

89382

Parent Item:

Parent Item Name:

D212-664-207 Crosstube Low Standard Aft **Start Date: 8/21/12** 

Required Date: 9/14/12

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 07.09.12 EC verified by: JLM IPP Rev:B ECN 1100p 08-01-11 DD verified by: EC
IPP Rev:C ECN 1121, 08-02-25 DD verified by:eC
IPP Rev: D QC5 replaced by QC15 at step 5 KJ Verified by: ec

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664-207TRNRevA Crosstube Turning Detail		Manufactured	No	B 862	75	110	Each	0.0000	1	1	) 1	VO .	12-9-1
<b>D3660-1</b> CUFF		Manufactured	No	-	·	140	Each	20.0000	2	2		<del></del>	
		•		Location		Loc Qty	<u>Lo</u>	oc Code					
				LG 803	559)	2 2					JW	12-	-9-21
				ST477	145)	10 10					JW	12	-9-21 .9-21
·				ST482	501	8							
				769 883	983	1							
CR3212-4-06 CHERRY RIVET	•	Purchased	No	002	,,,,	220	Each	796.0000	44	44	Ad	12 -	9-27
	•			<b>Location</b>		Loc Oty	<u>Lc</u>	oc Code					
<u>.</u>				ST329	2378)	503 503				14			
				ST330	0521	240 40							
					2141	200							
					2492	53 - 18							
					2794 9717	8 27							

NCR:	Yes / No				WORK ORDER NON-	CON	IFORI	VIANCE / UPI	DAIL			•
								-		QA Closed:	Date	•
Work Orde	er:				DISPOSITION				AGAINST DE	PARTMENT,	/PROCESS	
Part N			-		Rework Scrap		ı	Skid-tube Machining	Crosstube Small Fab		Water Jet d. Eng. Coor.	Engineering Quality
NCR N	10				Use-as-is Work Order Update			noforming Large Fab	Finishing Composite	Rec/Sto	re/Packaging Supplier	Other
Root				Descri	ption of work order update	lr	nitial	Act	ion	Sign &		
Cause	Date	Step	Qty	(	or Non-conformance	Chi	ef Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data												
Equip/Tooling												
Operator												
Material												
Setup												
Other												
Process	_					1						
Supplier												
Training						1						
Unapproved			11									
					<del></del>	AULT	CATE	GORY	<del> </del>			
Landir r	ng Gear				General					1		7
	Bending			_	Bend	$\vdash$	Grain		<b>—</b>	Ovalized	<u> </u>	Pressure/Forced
ŀ	Centre No	ot Concer	ntric to C	)/S	BOM/Route	$\mathbf{H}$	Hardwa		•	Over/Under	· · · · · ·	Temperature/Cure
F	Cracks				Broken/Damaged	-		on Incomplete	<del></del>	Part Incorred	<del>                                     </del>	Weld
	Crushed/0	Crimped.			Burrs	-		ions Incomplete/L	<del></del>	Part Lost/Mi	ssing	Wrong Stock Pulled
-	Cuffs				Contamination	-	Mainte		<b>├</b>	Part Moved		
-	Heat Trea				Countersink	_	Mislabe		<b></b>	Positioned V		7 .
1	Inspection		Tube	<u> </u>	Cut Too Short	-	Misread			Power Loss/	Surge	Other
-	Ripples in				Drill Holes	<del></del>	Offset					
Ļ	Torque W		xtrusion		Drawing	$\vdash$		Calibration				
	Turning So	equence			Finish		Out of S	equence				

Outside Dimensions

DQA:

Date: \_\_\_\_\_\_\_

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-24-12 1:44:46 PM

Work Order ID:	89382										
Parent Item:	D212-664-207							Date: 8/21/12		equired Dat	
Parent Item Name:	Crosstube Low Star	ndard Aft					Start	<b>Qty:</b> 1.00	]	Required Qty	y: 1.00
D3595-063-530 RUBBER CUSHION		Manufactured	No		240	Each	162.0000	4	4	<b>9</b> 55	12 10 0
				<b>Location</b>	Loc Qty		Loc Code				
				LG	50	,					
				79932	13						
				82656	37						
				LG051	73						
				87833	73						
				MAT052	39			7			
				63407	•			-			
				67185	(			-			
				70067	18						
				72745	2				<del></del>		
				75783	7						_
<b>)</b> 2940-1		Manufactured	No	70,00	240	Each	23.0000	2	2	ν <sup>Α</sup> • <b>Ο!</b>	S <b>5</b> 12 10
Support											9 12 10
				Location	Loc Qty		Loc Code			, , , , , , , , , , , , , , , , , , ,	-
				LG052	23						
				79118	2						
				82657	1						
				87921	20	)					
MS21920-28 Clamp(per MIL-DTL-87	783C)	Purchased	No		240	Each	78.0000	4	4	DA.	Slavo
, , , , , , , , , , , , , , , , , , ,	,			<b>Location</b>	Loc Qty		Loc Code			₹8-6	۶
				FG	4	;					
	<b>V</b>			105884	4			-			
4	B 122838			LG050	55						
-				118713	3						
				120054	2						
				122518	5(						
				LG051	18				<del></del>		
				121440							
				121440	1(						
				122204	10	,					

NCR:	Yes	/ No				WORK ORDER NON-	CO	NFORM	MANCE / UP	DATE			•
											QA Closed:	Date	•
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
		7/1				Rework Scrap Use-as-is		Therm	Skid-tube  Machining noforming	Crosstube Small Fab Finishing	-1	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR I	No.					Work Order Update	J		Large Fab	Composite	]	Supplier	
Root						ption of work order update	ì	Initial		tion	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Cł	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data	Ш						ŀ						
Equip/Tooling	Ш			ľ									
Operator	Ш		1										
Material	Ш												,
Setup	Ш												
Other	Ш												·
Process	Ш												
Supplier	Ш												
Training	Ш		[										
Unapproved			<u> </u>				1						
					<del></del>		AUI	LT CATE	GORY				
Landi					_	General		7		<u></u>	7		-
		Bending				Bend	<u> </u>	Grain			Ovalized		Pressure/Forced
	ш	Centre No	ot Concer	ntric to C	)/S	BOM/Route		Hardwa			Over/Under	<del></del>	Temperature/Cure
	-	Cracks				Broken/Damaged	L	1	on Incomplete		Part Incorred	ct	Weld
	-	Crushed/0	Crimped.			Burrs	L	4	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	⊢⊣	Cuffs				Contamination		Mainte			Part Moved		
	Ш	Heat Trea	t			Countersink		Mislabe	led		Positioned V		7
	—	Inspection		Tube		Cut Too Short	L	Misread	ł		Power Loss/	Surge	Other
	Ш	Ripples in	Bend			Drill Holes		Offset					
		Torque W	aves in E	xtrusion		Drawing		Out of C	Calibration				

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

August-24-12 1:44:46 PM

Work Order ID:

89382

Parent Item:

Placard

D212-664-207

Parent Item Name:

Crosstube Low Standard Aft

Manufactured

No

255

Each

13.0000

Loc Code

Loc Code

**Start Date: 8/21/12** 

Start Qty: 1.00

Required Qty: 1.00

Required Date: 9/14/12

MS210421 Nut

Purchased

No

83582 85228

122441

122407

120423

121825

Location

Location

314

ST300

Location ST340

ST342

ST042

255

Loc Qty

Loc Qty

13

12

578

578

291

Each

869.0000

89.0000

Loc Code

M/2244/

AN960JD616
Washer.
ANG-IJA
Bolt

NAS1149D0663J

Purchased

No

Purchased No 117677 25 118384 3 118927 48 15 119075 120308 200 255 0.0000 Each

Loc Qty

50

50

39

9

30

255

Each

18 2

NCR:	Yes	/ No				WORK ORDER NON-C	COL	NFOR	MANCE / UPDATE		0.4.61	5		~
								r			QA Closed:	Dat	e:	
Work Ord	er.					DISPOSITION			AGA	AINST DE	PARTMENT	/PROCESS		
						Rework	]		<del>}</del>	stube		Water Jet	Engine	
Part l	No.					Scrap	] :		<b>Ŭ</b>	Il Fab	1	d. Eng. Coor.		ality
						Use-as-is	1		~ <del></del>	shing	Rec/Sto	re/Packaging	<b>⊣</b> °	ther
NCR	No.	<del> </del>				Work Order Update	J		Large Fab Comp	osite		Supplier		
Root					Descri	ption of work order update		Initial	Action		Sign &			
Cause		Date	Step	Qty		or Non-conformance	Ch	nief Eng	Description		Date	Verification	n QC In	spector
Doc/Data														
Equip/Tooling	Ш								·					
Operator									·					
Material	Щ			•										
Setup	Ш													
Other	Ш				2									
Process	$\square$													
Supplier	$\vdash$													
Training	Н			·		•								
Unapproved				<u> </u>	<u> </u>			TCATE	CORV					
Landi		`~~				General F	AUL	T CATE	JURY					
Lanui		Bending				Bend		Grain			Ovalized	ſ	Pressure/I	Forced
	——	Centre No	nt Concer	etric to	0/5	BOM/Route	$\vdash$	Hardwa	ro	-	Ovalized Over/Under	toloranco	Temperat	
	${m  o}$	Cracks	or concer	iti ic to	~,	Broken/Damaged	-	1	on Incomplete	· · · · · ·	Part Incorre	1	Weld	ure/Cure
	Н	Crushed/	Crimned			Burrs	H	1	ions Incomplete/Unclear		Part Lost/Mi	1	Wrong Sto	nck Pulled
	$\boldsymbol{\vdash}$	Cuffs	ermpeu.			Contamination	H	Mainte	•		Part Moved	3311B [	WTOTIG SIC	Jek i diled
		Heat Trea	ıt			Countersink	$\vdash$	Mislabe			Positioned V	Vrong		
	₩	Inspection		Tube		Cut Too Short		Misread		<del></del>	Power Loss/		Other	
		Ripples in				Drill Holes	Н	Offset		L	1 2 2 . 2000/	0-	1 - 1.75	· <del></del>
	-	Torque W		xtrusio	n	Drawing	$\vdash$	i	Calibration		-			
		Turning S				Finish	-	ł	equence					

Outside Dimensions

DQA:

Date:

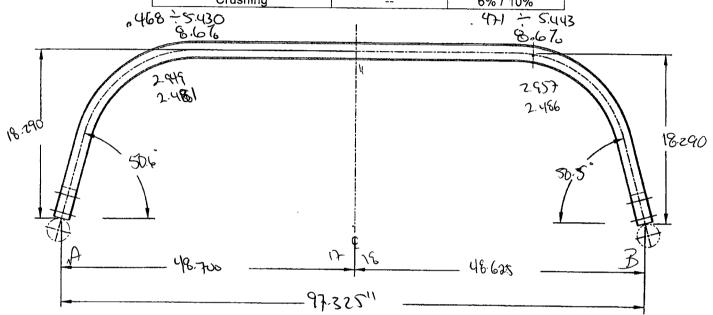
Wave/Twist in Tube

Finish Folio

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DART AEROSPACE LTD	Work Order:	89382
Description: Crosstube Low Aft (205/212)	Part Number:	D212-664-207
Inspection Dwg: D212-664-247 Rev: B		Page 1 of 1

Required Dimension	Min	Max
Height	18.16	18.42
1/2 Span	48.55	48.81
Angle	49	52
Total Span	97.1	97.62
Bending Passes	8	
Crushing		6% / 10%



	Side A	Migore	Side B
<b>Bending Passes</b>	(7	V(	18.
Crushing	8.60		8.67.
	Commen	ts 🖳	
Simp Az 8.6	10 crushin	(w) 17	Passo.
- 11 -	Besen		
Sine B2 8.6	To veshi	(D) 18B	Paster.
-			<del></del>

	- 4.0
QC15 Inspection	0.01
Date	8-9 17 69 19

Rev	Date	Change	Revised by	Approved
Α	08.02.29	New Issue	KJ/JM	rippiorea
В	10.04.01	Dwg Rev updated	KJ ^	
С	12.04.16	Added bending, crushing dimensions	KJ 🚓	· In

ltem	Qty -247	Qty -247B	Part Number	Description
1	X		D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
2		Х	D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)
3	1	1	D6008-132	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	2	_2	D3660-1	CUFF
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

#### GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6008-132

FINISHED LENGTH = 128.268±0.020 (BEFORE BENDING/TRIMMING)

CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART QSI 005 4.2

3) TOLERANCES ARE PER DART QS 0.018 UNLESS OTHERWISE NOTED.
4) UNITS: INCHES UNLESS OTHERWISE NOTED.
5) BREAK SHARP EDGES: 0.005 TO 0.010 MaX.

IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS. WEIGHT: D212-664-247 = 36.6 lbs (PER IIN-D212-664) D212-664-247B = 36.6 lbs (PER IIN-D212-664)

PART IS SYMMETRIC ABOUT CENTERLINE.
WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD

10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON 0.D. EXCEPTUP TO 10% IS ALLOWED IN AREA NOTED.

11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

12) INSTALL D2940-I SUPPORT USING 0.03 "TO 0.06" THICK LAYER OF MACNOBOND 6398 TO THE SURFACE OF

D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER

D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE MEN USIONS. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE INNACCEPTABLE. UNACCEPTABLE.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

16) INSTALL D3660-1 CUFFAFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE SEAL EDGE OF CUFF TO ENSURE NO GAPS.

17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

SHOP COPY RETURN TO ENGINEERANG UNCONTROLL SUBJECT TO AMEND ME WORK ORDER MLJ NO\_89382 MLJ 12/08/29 WITHOUT NOTICE

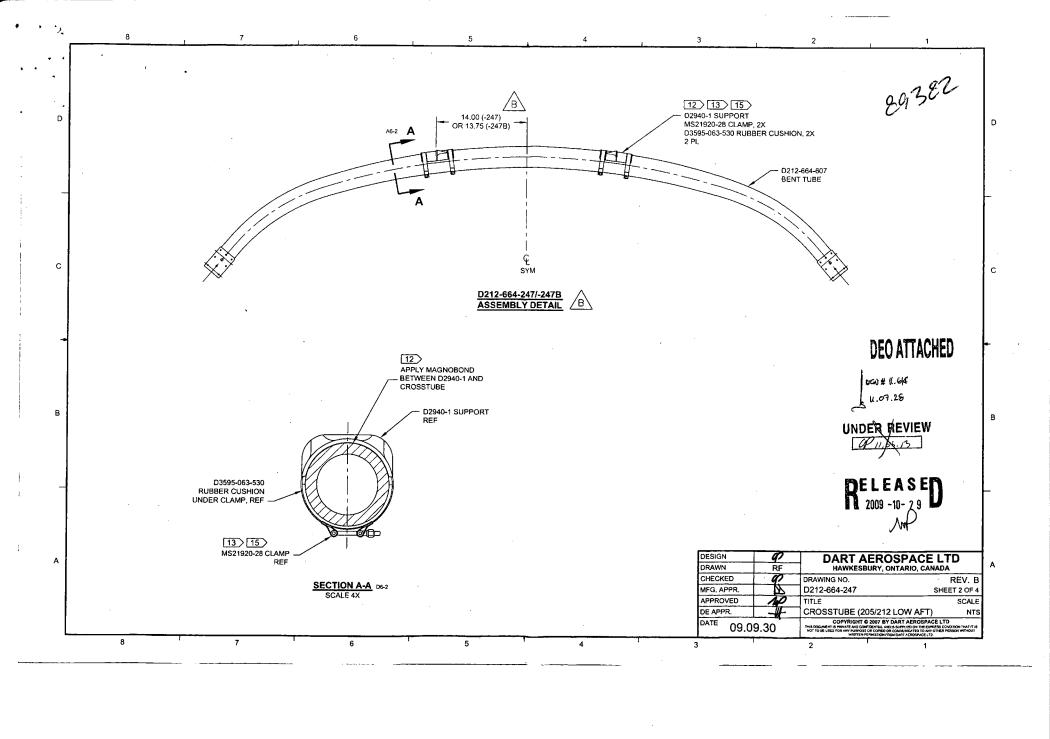
DEO ATTACHED

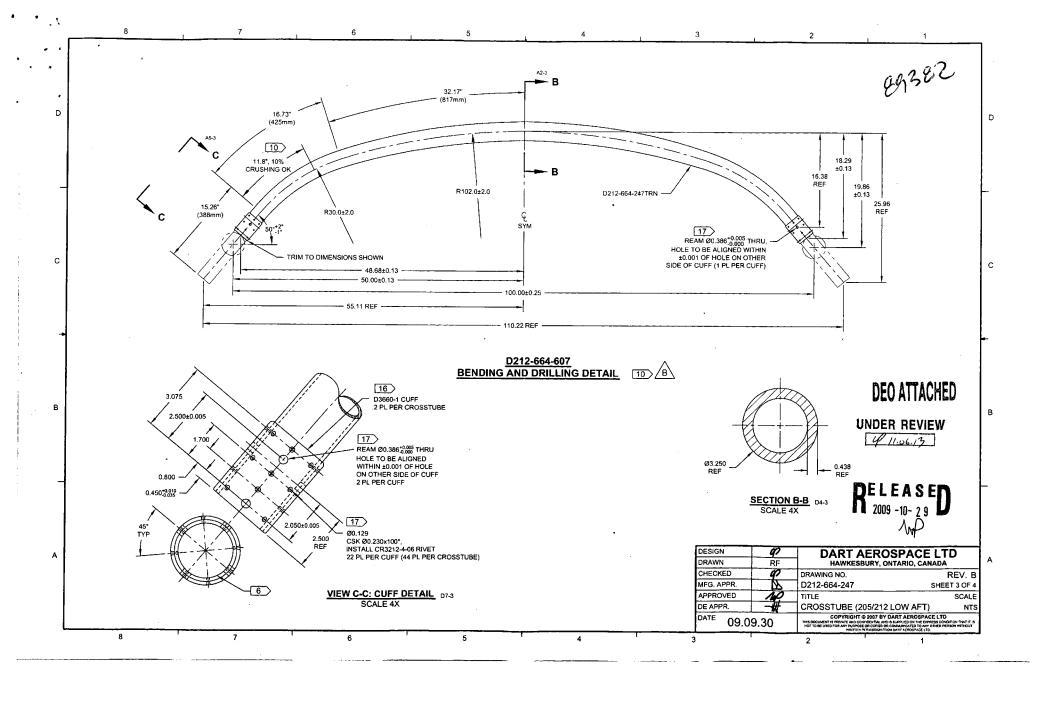
DGV# 11-614 11.07.28

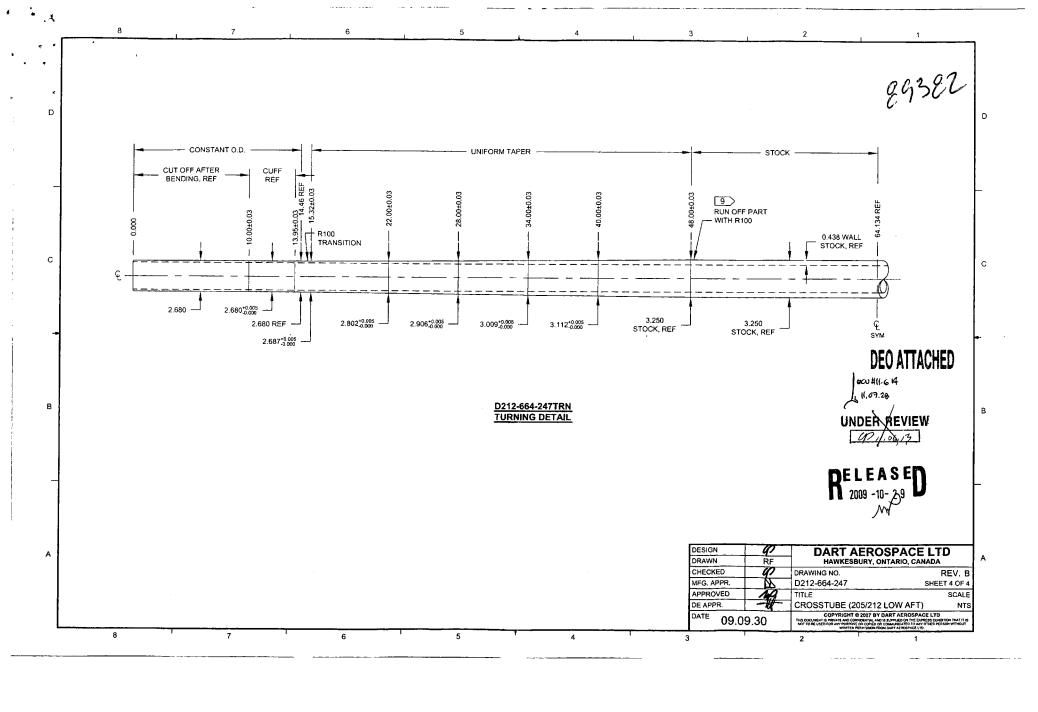
В		E GENERAL N ENT STANDAR	RF 09.09.3						
Α	NEW IS	SSUE	CP	07.07.07					
REV.			BY	DATE					
DESIGN		a)	DART AEROSP	ACE	LTD				
DRAWN	-	RF	HAWKESBURY, ONTARIO, CANADA						
CHECKED P		97	DRAWING NO.	REV. B					
MFG. AF	PPR.	107	D212-664-247	SHEET 1 OF 4					
APPROVED 10		NO	TITLE		SCALE				
DE APPR.			CROSSTUBE (205/212 LOW AFT) NT						
DATE 09.09.30			COPYRIGHT © 2007 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND COMPRIDENTIAL, AND IS SUPPLIED ON THE DOPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSS OR CORED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WINTERS PERSONS ON PROMI DART AEROPHOCULTO.						

С

В







DRAWING NO.	TITLE PE	DADT ACROSS ACE	1.70	*	
1	INC.	/. B DART AEROSPACE	LTD D.E.O. NO.	SHEET NO.	SCALE
D212-664-247	CROSSTUBE ASS'Y (205 LOW AF	) ENGINEERING ORD	ER D212-664-247-B-1	SHEET 1 OF 1	NTS
DRAWN 97	CHECKED ASS	MFG. APPR.	APPROVED (W)	DE APPR.	
DATE 11.07	15 DATE 11,07.20	DATE 11.07.21	DATE 11/07/21	DATE 11.07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

29322

#### **CHANGE:**

IS:

-247 -247B		Description					
A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2					

#### WAS:

9	A/R	A/R	ROCKWELL SPECIFICATION RBO-120-023
			ADHESIVE (TEXTRON/BELL SPEC. 299-947-100,
			TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

#### IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

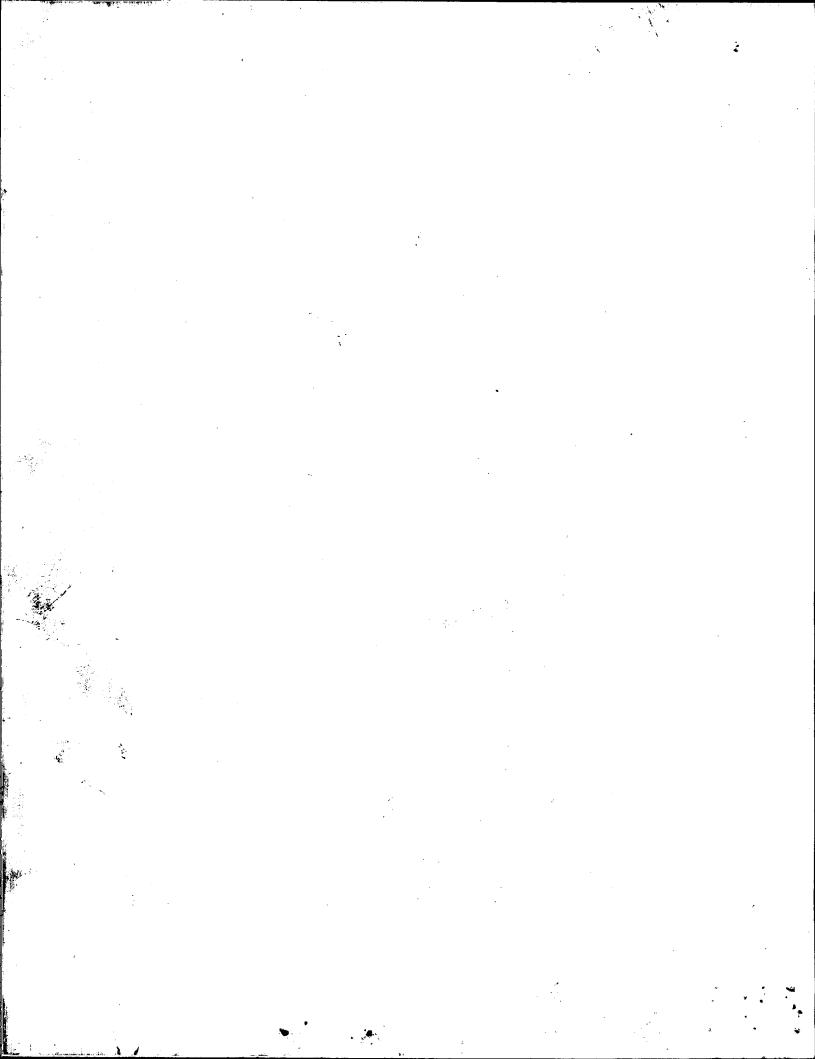
#### WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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### 5.2 STANDARD GEAR CROSSTUBES

TH-1F/L, HH-1K STANDARD FWD  CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT  CROSSTUBE INSTALLATION, 412 STANDARD AFT  CROSSTUBE ASSEMBLY.	item	-107	F-207	-209	Part Number	Description					
X		x			D212-664-107	204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD					
A			х		D212-664-207	204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT					
D212-664-147				x	D412-664-209	· · · · · · · · · · · · · · · · · · ·					
7         1         D212-664-247         204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT           8         1         D412-664-249         CROSSTUBE ASSEMBLY, 412 STANDARD AFT           10         2         *D2893-1         SUPPORT           11         4         *D3595-063-450         RUBBER CUSHION           12         4         *MS21920-25         CLAMP (OR MS21042-26)           13         4         AN6-35A         BOLT           14         4         AN6-36A         BOLT           15         6         MS21042L6         NUT (OR MS21042-6)           16         18         AN960JD616         WASHER           20         2         *D2940-1         SUPPORT           21         4         *D3595-063-530         RUBBER CUSHION           22         4         *MS21920-28         CLAMP (OR MS21042-30)           23         4         AN6-40A         BOLT           24         / 2         AN6-41A         BOLT           25         7 6         MS21042L6         NUT (OR MS21042-6)           30         1         *D2896-1         SUPPORT           32         2         *D3595-063-570         RUBBER CUSHION	6	1			D212-664-147	204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD					
1	7		1		D212-664-247	204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT					
10	8			1	D412-664-249						
10	10	2			* D2893-1	SUPPORT					
112 4 * MS21920-25 CLAMP (OR MS21042-26)  13 4 AN6-35A BOLT  14 4 AN6-36A BOLT  15 6 MS21042L6 NUT (OR MS21042-6)  16 18 AN960JD616 WASHER  20 2 * D2940-1 SUPPORT  21 4 * D3595-063-530 RUBBER CUSHION  22 4 * MS21920-28 CLAMP (OR MS21042-30)  23 4 AN6-40A BOLT  24 / 2 AN6-41A BOLT  25 7 6 MS21042L6 NUT (OR MS21042-6)  30 1 * D2896-1 SUPPORT  31 * D2896-1 SUPPORT  32 2 * D3595-063-570 RUBBER CUSHION  33 4 * MS21920-28 CLAMP (OR MS21042-6)  34 AN6-40A BOLT  35 AN960JD616 WASHER  36 AN960JD616 WASHER  37 * MS21920-28 CLAMP  38 AN6-40A BOLT  39 * MS21920-30 CLAMP (OR MS21042-32)  36 * AN6-40A BOLT  37 * MS21920-30 CLAMP (OR MS21042-32)  38 * AN6-40A BOLT  39 * AN6-40A BOLT  30 * MS21920-30 CLAMP (OR MS21042-32)  31 * MS21920-30 CLAMP (OR MS21042-32)  32 * MS21920-30 CLAMP (OR MS21042-32)  33 * AN6-40A BOLT  34 * AN6-40A BOLT  35 * AN6-40A BOLT  36 * AN6-40A BOLT  37 * AN6-40A BOLT  38 * AN960JD616 WASHER  39 * AN6-41A BOLT  40 * CR3212-4-06 RIVET (M7885/3-4-06)  41 * CR3212-4-07 RIVET (M7885/3-4-07)											
13			+			CLAMP (OR MS21042-26)					
14			<del> </del>								
MS21042L6			<del>-{</del> -			BOLT					
16					MS21042L6	NUT (OR MS21042-6)					
20						WASHER					
21	20		2		* D2940-1	SUPPORT					
22						RUBBER CUSHION					
23						CLAMP (OR MS21042-30)					
24											
25						BOLT					
26						NUT (OR MS21042-6)					
30											
32	12         4         *MS21920-25           13         4         AN6-35A           14         4         AN6-36A           15         6         MS21042L6           16         18         AN960JD616           20         2         *D2940-1           21         4         *D3595-063-530           22         4         *MS21920-28           23         4         AN6-40A           24         / 2         AN6-41A           25         7 6         MS21042L6           26         18         AN960JD616           30         1         *D2896-1           32         2         *D3595-063-570           33         4         *MS21920-28		+ B00004	CURRORT							
33			ļ			11.00					
34 2 * MS21920-30 CLAMP (OR MS21042-32) 35 4 AN6-40A BOLT 36 2 AN6-41A BOLT 37 6 MS21042L6 NUT (OR MS21042-6) 38 18 AN960JD616 WASHER 39 2 * D3189-1 CHAFING SHIELD  45 2 * D3659-1 CUFF 46 2 2 * D3660-1 CUFF 47 44 44 * CR3212-4-06 RIVET (M7885/3-4-06) 48 44 * CR3212-4-07 RIVET (M7885/3-4-07)			ļ								
35	$\overline{}$										
36 2 AN6-41A BOLT 37 6 MS21042L6 NUT (OR MS21042-6) 38 18 AN960JD616 WASHER 39 2 * D3189-1 CHAFING SHIELD  45 2 * D3659-1 CUFF 46 2 2 * D3660-1 CUFF 47 44 44 * CR3212-4-06 RIVET (M7885/3-4-06) 48 44 * CR3212-4-07 RIVET (M7885/3-4-07)			<del> </del>								
37 6 MS21042L6 NUT (OR MS21042-6) 38 18 AN960JD616 WASHER 39 2 *D3189-1 CHAFING SHIELD  45 2 *D3659-1 CUFF 46 2 2 *D3660-1 CUFF 47 44 44 *CR3212-4-06 RIVET (M7885/3-4-06) 48 44 *CR3212-4-07 RIVET (M7885/3-4-07)		ļ <u>.</u> .	<del> </del>								
38			-								
38 2 * D3189-1 CHAFING SHIELD  45 2 * D3659-1 CUFF  46 2 2 * D3660-1 CUFF  47 44 44 * CR3212-4-06 RIVET (M7885/3-4-06)  48 44 * CR3212-4-07 RIVET (M7885/3-4-07)	_		<b></b>								
45 2 * D3659-1 CUFF 46 2 2 * D3660-1 CUFF 47 44 44 * * CR3212-4-06 RIVET (M7885/3-4-06) 48 * CR3212-4-07 RIVET (M7885/3-4-07)			<del> </del>								
46 2 2 * D3660-1 CUFF 47 44 44 * CR3212-4-06 RIVET (M7885/3-4-06) 48 44 * CR3212-4-07 RIVET (M7885/3-4-07)	39										
47 44 44 * CR3212-4-06 RIVET (M7885/3-4-06) 48 44 * CR3212-4-07 RIVET (M7885/3-4-07)	45	2									
48	46			2							
40 PLACADD		44	44								
50 1 / 1 PLACARD	48			44	* CR3212-4-07	KIVET (M/885/3-4-U/)					
	50	1	111		-D3428-1	PLACARD					

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-147/-247 OR D412-664-249 ASSEMBLIES ABOVE NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AAI SKIDTUBES.

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Revision: G

Date: 11.08.30



## LIQUID PENETRANT TEST REPORT

P- 10162 .

ACOREM				,
	125120	ż	PAGE	OF
CLIENT	DAK! AELOSPACE	DATE ST	127/02/2 TIME	AM PM
ATTENTION	LINDA CHANTAGE	ACUREN JOB NO.	8-17-6019	71
ADDRESS	1270 ABERDEN ST.	POWO No.		
	HAWKES BURY, O	WORK LOCATION AS	ADDRESS	
		ACCEPTANCE STD. ASTMI	4/7 & SYT 03801 REV./DAT	E
PROJECT	PT-WET FLUCRESCENT X			
TEM(S) EXAMINED		·		
	SZ BELOW		,	
JOB DESCRIPTION	PROCEDURE No. LTOO REV.	/DATE 2007 TECHNIQUE	No. LT-	E 2007
PART NO.		MATERIAL ALUMINUI	4/5/5 THICKNESS	WH
SCOPE <b>Perfo</b>	emed a wet-Flee LPI OD	100% OF THE EXIE	RNAC SURFACE C	ON FREMS
ME	WT. BELOW			
TEST DETAILS				
VIETHOD	FLUORESCENT VISIBLE	WATER WASH	☐ SOLVENT REMOVABLE	☐ Post Emulsified
PENETRANT	ACDAFLANDWELLTIME 10		GHT ☐ TROUBLELIGHT ☐ OUT	
PENETRANT REMOV		MIN. OTHER	-	-012100 IC W SURFACE
DEVELOPER S	(D-S- MINIMUM DWELL TIME 10	MIN. LIGHT METER S/N /093	866 CAL DU	DATE OF BOD
DEVELOPER TYPE  TEST SURFACE	Non Aqueous 🖸 Aqueous 🗍 Dr	(		, , , , , , , , , , , , , , , , , , ,
SURFACE CONDITIO	N ☐ AS GROUND ☐ AS WELDED	☐ MACHINED ☐ SHO	r Blasted	LEAN BARE METAL
	TURE - <- 4°C/ 20°F - 4°C/ 20°F TO 1			52°C/125°F
RESULTS-	( Metric IMPerial)			
ITEV	COMMENTS 4: CEPT	850507		
CRGS	mbe W.O. ID 88404	ITEM ID	D212-664-	201 AFT
	89254	TIEM ID	Da12-664	- 20 LAFT
_3,	8926	ITEM ID	Da12-664	- TO FROHIL
4	81364	ITEM ID	D312-664-	101 Faid HiGH
\$	<u> </u>	(09/2) ITEM (1)>	DZ12=664-	201AFT
<u></u>	\$9333	- TITEM TO	DD12-664.	
2	40580	- ITM IN	1313-664	41-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-
OBX	MOUNT WOLD 33607	- TEW ZD	73687-1	
1/2 22 -	LOUIT SINVENTIAL WAS DE	201		
NO KELE	POWER OF WAR ASSE	RIED		
45 KEIL H	PPLICABLE STANDARD AT THE TIME O			
INSPECT	SON		and the control of th	
	roup Inc. to perform services extends only to those services provided for in wri			
representations or warranti	ents and expressions of opinion reflect the opinions or observations of Acuren C es. Acuren Group Inc. is not assuming any responsibilities of the owner/opera	tor and the owner/operator retains complete responsib	ility for the engineering, manufacture, repair	
Standard of Care	rovided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in		, .	. ,
n performing the services p mplied, is made or intended	provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised by Acuren Group Inc.	under similar circumstances by others performing su	ch services in the same or similar locality. N	o other warranty, expressed or
SIGNATURES				
CLIENT REPRESEN	ITATIVE Andy Sheldon	Ahelda	DTR# & 8	5062
TECHNICIAN (SIGNA	TURE):	SIGNATURE	REPORT	
`	Tyles 1 - 2-65		REVIEWED BY:	
VAME (PRINT):	1 <sup>st</sup> TECHNICIAN	2 <sup>ND</sup> TECHNICIAN	NAME	INITIALS
		GSB LEVEL SNT LEVEL		
		CGSB REG NO		

atus	Item ID Rev	Name	Start Date	antity	FJOI	vop Da	aute Se	qcrap	ʻap Qua	ommerind	NEC lESortime O	fset an Ty <sub>l</sub>	1 Per O	rch to V	iore C	de Last N	Add Da
	AN6-40A	Bolt	1/1/2008	4.0	. Ea		255	0 %	0.0000	3	10	0 MRP				10/1	12/5
	AN6-41A	Bolt	1/1/2008	2.0	. Ea	7/	255	0 %	0.0000	d'i	11	0 MRP	: :			9/20/	. 12/5
	AN960JD616	Washer	1/1/2008	18	. Ea	7/	255	0 %	0.0000	<u>a</u> j	9	0 MRP				9/204.	12/5.
an a contraded by economic factor	CR3212-4-06	CHERRY RIVET	1/1/2008	44	. Ea	7/	220	0 %	0.0000	.31	. 3	0 MRP		,		9/2041. -I	12/5
	D212-664-207TRN	Crosstube Turning	. 1/1/2008	1.0	. Ea	12	110	0 %	0.0000	0)	1	0 MRP			i :	9/20≱.	12/5
	D2940-1	Support	12/5/2009	2.0	. Ea	7/	240	0 %	0.0000	3.1	5	0 MRP			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	9/207	12/5
	D3428-1	Placard	12/5/2009	1.0	. Ea	7/	255	0 %	0.0000	4)	7	0 MRP				9/20%	12/5
*********	D3595-063-530	RUBBER CUSHION	12/5/2009	4.0	. Ea	7/	240	0 %	0.0000	3	4	0 MRP				9/200.	2/5
	D3660-1	CUFF	12/5/2009	2.0	. Ea	7/	140	0 %	0.0000	3	2	0 MRP	,			9/20/	. 12/5.
	MS21042L6	Nut	1/1/2008	6.0	. Ea	7/	255	0 %	0.0000		8	0 MRP	:		:	9/20/	12/5.
	MS21920-28	Clamp(per MIL-D	1/1/2008	4.0	. Ea	7/	240	0 %	0.0000	31	6	0 MRP				9/20/	. 12/5.